Final Assembly Platen Space Allocation
at Northrop Grumman Newport News
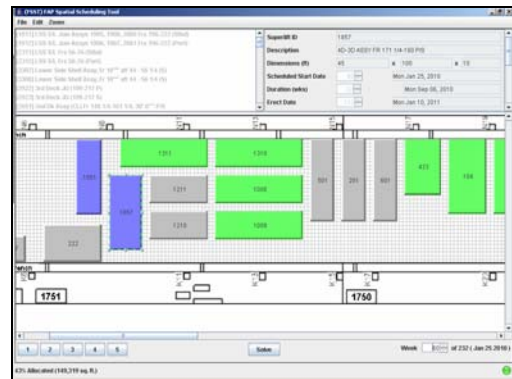
Status: Transitioned

PROBLEM / OBJECTIVE

Northrop Grumman Newport News (NGNN) will build the CVN 21 class aircraft carrier structure using over 160 superlifts, large building blocks constructed and outfitted on the Final Assembly Platen (FAP). The dynamic allocation of FAP space has traditionally proven to be a formidable task for NGNN planners. Cumbersome CAD packages have been used to create FAP "footprints" over the four-year erection period of the carrier, however, this method of allocating FAP space has limited NGNN's ability to optimize the use of FAP space and rapidly conduct analyses of several what-if scenarios. The objective of this project is to provide NGNN with a robust spatial scheduling tool that reduces the manual effort for generating FAP footprints, increases the utilization of FAP space, and allows for rapid generation of alternative footprint plans. Automating the development of alternative footprint plans is also being studied as part of this task. CVN21 Program Office (PMS 378) should benefit from reduced acquisition costs.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

A prototype FAP Spatial Scheduling tool was developed using Java^{TM} programming. The tool allows for visualization of a footprint plan at weekly time increments, and permits users to easily modify this plan based on a given erection schedule. Penn State ARL is currently evaluating the feasibility of using an expert system to automate the FAP footprinting process, further reducing the manual effort of this task. This solution method would suggest superlift placements based on a collection of rules, constraints, and preferences defined by subject matter experts at NGNN. Given the positive response from NGNN on the FAP Spatial Scheduling tool, additional tools will be considered for others areas in the shipyard, including Steel Production and Fabrication and Virginia Class Submarine construction.

Prototype FAP Spatial Scheduling Tool

Implementation and Technology Transfer:

The FAP Spatial Scheduling tool was transitioned to the CVN 77 structural construction superintendent to be used for the spatial scheduling of the remaining CVN 77 superlifts. Future modifications to the FAP Spatial Scheduling tool will be made based on NGNN requests, and a finalized version will be delivered to NGNN for use in generating FAP footprint plans for the first in class CVN 21 carrier.

Expected Benefits:

- The FAP Spatial Scheduling tool is expected to reduce man-hour planning efforts by 80%
- Outfitting additional assemblies on the FAP identified through the use of the FAP Spatial Scheduling tool results in a savings of ~$25K per assembly
- The FAP Spatial Scheduling tool allows users to rapidly generate multiple footprint plans to maximize the use of the FAP
- Reduced CVN 21 acquisition costs and construction duration

TIMELINE / MILESTONE

Start Date: October 2004
End Date: September 2005

FUNDING

Total ManTech Investment: $140K
Voluntary Cost Share (NGNN): $69K

PARTICIPANTS

Penn State ARL (iMAST)
Northrop Grumman Newport News